

Q QUINTILLION

Alaska Broadband Task Force Brief

26 July 2021

COSTS AND CHALLENGES OF
OPERATING IN THE ALASKA
ARCTIC

PRESENTED BY

Mac McHale

Chief Revenue Officer

&

Matt Peterson

Chief Technology Officer

What is the current status of Quintillion and what are the arctic challenges?



- Quintillion's Phase 1 network is COMPLETE and has been operational since December 2017
 - The network consists of 1180 miles/1900 KM of sub-sea Fiber optics built along the west coast and north slope of Alaska
 - It stretches from Nome to Prudhoe Bay
 - We have 6 live cable landing stations on Nome, Kotz, Point Hope, Wainwright, Utqiagvik, and Prudhoe Bay
 - It is a 3 pair 10T system
- The system connects to our terrestrial network in Prudhoe to Fairbanks and ultimately to Washington and Oregon
- It also connects in Prudhoe to an oil/gas infield fiber network extending 60 miles west

What is the current status of Quintillion and what are the arctic challenges?



- We interconnect at each of our CLS's with the incumbent Telecom provider in the area
 - We deliver primarily wholesale EPL service to ILEC at 10M to 10GE levels
 - The incumbents in turn provide retail services in these frontier markets to business, consumers and anchor institutions
- To address the Arctic challenges (harsh environment, Short ice free season, limited support) we built the system to last with:
 - High quality and durable fiber
 - Main trunk buried 12"
 - Branch landings at up to 80" to avoid risks of ice scour, errant anchors and geological disturbances

What is the current status of Quintillion and what are the arctic challenges?



- With this durable system we continue to expand further inland by partnering with incumbent local access providers or by building organically
 - Fiber, Licensed MW and other wireless tech will facilitate ever increasing access to frontier markets in AK
- Our current network is a platform for expansion
 - Three phase strategy
 - 3 phases are IN- OUT- AND- UP

OUR VISION IS TO ESTABLISH ALASKA AS THE US ARCTIC GATEWAY/BRIDGE TO EUROPE AND ASIA AS WELL AS PROVIDING A HIGH LATITUDE DATA ACQUISITION (HiLDA) SITE FOR POLAR ORBITING SATELLITES DOWNLINK REQUIREMENTS.

Quintillion Subsea Fiber Installation

1900km Quintillion subsea fiber cable system completed in 2017



The harsh environment, short and unpredictable ice-free season, very limited logistical and emergency support, and regulatory requirements (polar code, marine mammal protection, etc...) all complicate Arctic offshore operations

Quintillion Subsea Fiber Installation

Cable installation and burial required three cable ships and three barge platforms during 2016 and 2017 open water seasons

Subsea plowing equipment and techniques were developed, qualified, and deployed specifically to meet the unique challenges in the Arctic

Q



Quintillion Subsea Fiber Installation

- Multiple barge mobilizations were required to complete cable installation and burial across shallow water approaches



Towed vibratory plow



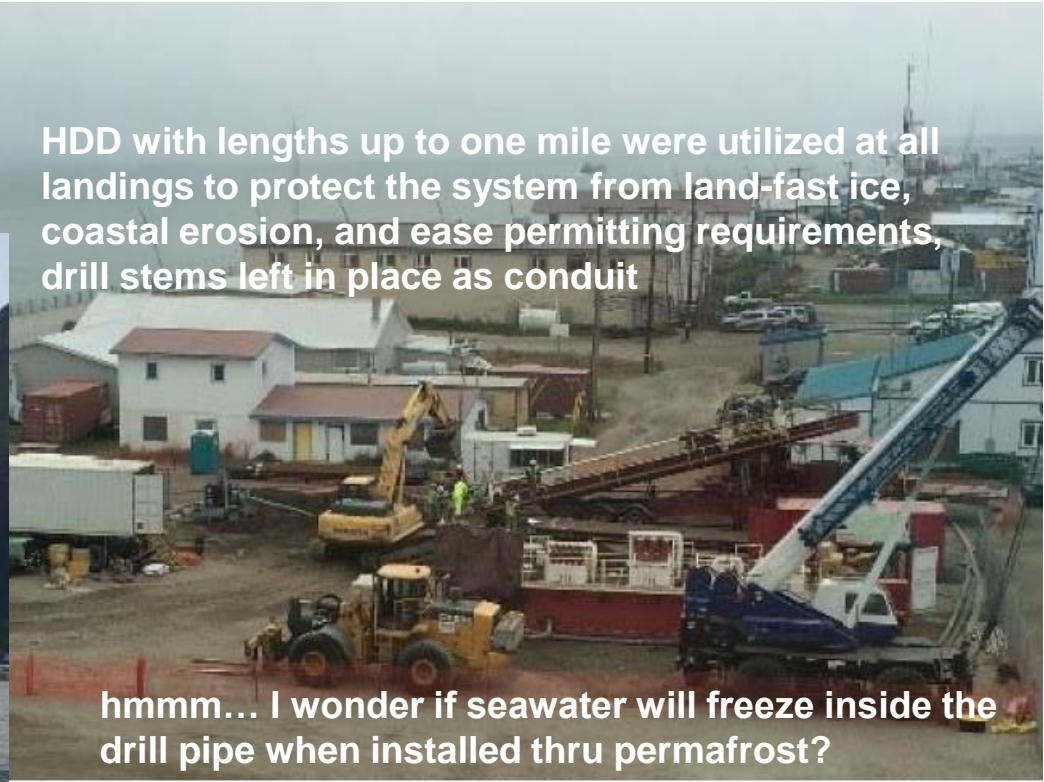
**Self propelled
water-jet sled**

Quintillion Subsea Fiber Installation

Horizontal Direction Drilling (HDD) Program

Extensive mobilization costs to remote landing locations resulted in >10x the cost of a typical subsea cable HDD


HDD with lengths up to one mile were utilized at all landings to protect the system from land-fast ice, coastal erosion, and ease permitting requirements, drill stems left in place as conduit



hmmm... I wonder if seawater will freeze inside the drill pipe when installed thru permafrost?

Quintillion Subsea Fiber Installation

- Construction work in the Arctic requires working in unique and challenging environmental conditions

A photograph showing a ship's deck with a crane lifting a Remote Operated Vehicle (ROV) into the water. The sea is covered with a layer of thin, pancake ice. In the background, there are snow-capped mountains under a cloudy sky.

ROV deployment
through rapidly
forming pancake ice
near Oliktok Point in
the Beaufort Sea

A photograph of a yellow and white Remote Operated Vehicle (ROV) mounted on a ship's deck. The ROV has a yellow body with a blue and white logo. It is surrounded by various mechanical components and cables. A person in a red jacket is visible near the ROV. The ship's deck is made of metal grating.

Remote Operated Vehicle (ROV) used for
post-lay cable burial and inspection

Arctic Fiber Optic Cable Construction

Terrestrial fiber construction in the Arctic poses many challenges

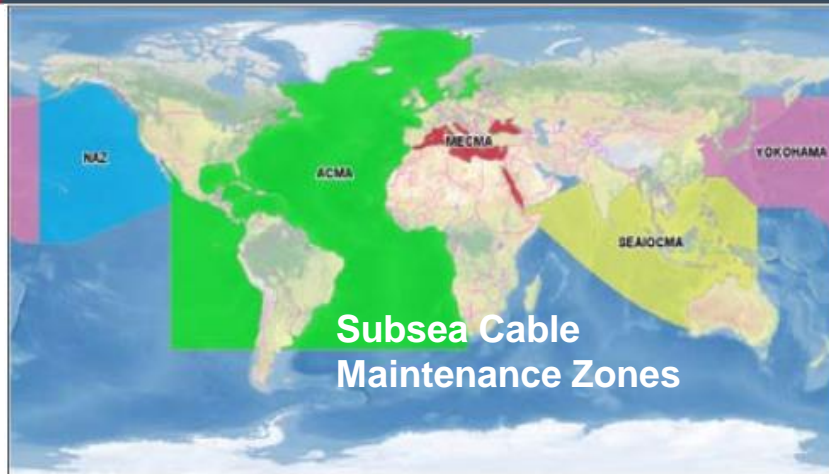


A brief break from darkness during winter fiber optic cable installation nearby Alyeska Pump Station #1

Spine Road (Prudhoe Bay) terrestrial construction

Subsea Cable Operations

Without a cable maintenance zone covering the US Arctic we bear 100% of the costs to charter maintenance vessels and store spare equipment at >10x the cost/km of NAZ membership



Quintillion Dutch Harbor Cable Depot



Regional Fiber Systems in Planning Stages

Planned subsea fiber, microwave, and fixed-wireless networks will bring broadband services to Unalakleet, Savoonga, and Gambell, Alaska





Thank you

